

This listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently amended) A method for producing aligned carbon nanostructures comprising:

(a) providing (i) finely divided substrate particles having substantially smooth faces with radii of curvature of more than 1 μm and of length and breadth between 1 μm and 5 mm and having catalyst material on their surface and (ii) a carbon-containing gas at a temperature and pressure at which the carbon-containing gas will react to form carbon when in the presence of the supported catalyst, and

(b) forming aligned nanostructures by the carbon-forming reaction,

wherein the substrate particles having catalyst material on their surface are prepared by depositing catalyst material on the surface of the substrate particles by electroless deposition, solvent drying, supercritical drying, sputtering, physical vapour deposition or electroplating,

and further wherein the catalyst material is a transition metal, an alloy of two or more thereof, a compound of a transition metal or a mixture of two or more compounds of transition metals.

2. (Original) A method as claimed in Claim 1, wherein the faces have radii of curvature of more than 10 μm .

3. (Previously presented) A method as claimed in Claim 1, wherein the substantially smooth faces are substantially flat.

4. (Previously presented) A method as claimed in Claim 1, wherein the catalyst material is dispersed in clusters on the surface of the substrate particles.

5. (Original) A method as claimed in Claim 4, wherein the catalyst material clusters are from 0.5 nm to 100 nm in dimension.

6. (Original) A method as claimed in Claim 5, wherein the catalyst material clusters are from 3 nm to 50 nm in dimension.

7-11. (Canceled)

12. (Previously presented) A method as claimed in Claim 1, wherein the length and breadth of the substrate particle faces are between 10 μm and 500 μm .

13. (Previously presented) A method as claimed in Claim 1, wherein the substrate particles are of silica, alumina, carbon, mica, magnesium oxide, calcium oxide, sodium chloride, pure metal or aluminosilicate or a mixture of two or more thereof.

14. (Currently amended) A method as claimed in Claim [[13]] 1, wherein the substrate particles are of graphite, aluminium or titanium.

15. (Previously presented) A method as claimed in Claim 1, wherein the substrate particles are anisotropic.

16. (Original) A method as claimed in Claim 15, wherein the substrate particles have one dimension larger than the other two dimensions or wherein the substrate particles have one dimension smaller than the other two dimensions.

17. (Previously presented) A method as claimed in Claim 1, where the substrates are coated with a buffer layer.

18. (Previously presented) A method as claimed in Claim 1, wherein the substrate is freshly prepared.

19. (Original) A method as claimed in Claim 18, wherein the substrate is prepared by colloidal processing, spray-drying, hydrothermal processing, or ball-milling.

20. (Canceled)

21. (Currently amended) A method as claimed in Claim [[20]] 1, wherein the transition metal is iron, cobalt, molybdenum or nickel.

22. (Currently amended) A method as claimed in Claim [[9]] 1, wherein the catalyst precursor is a transition metal carbonyl, or a transition metal cyclopentadienyl compound.

23. (Original) A method as claimed in Claim 22, wherein the catalyst precursor is ferrocene, nickelocene, cobaltocene, iron pentacarbonyl or nickel tetracarbonyl.

24. (Previously presented) A method as claimed in Claim 1, wherein the carbon containing gas is carbon monoxide, an oxygen containing organic compound or a hydrocarbon, or a mixture of two or more thereof.

25. (Original) A method as claimed in Claim 24, wherein the carbon containing gas is carbon monoxide, benzene, toluene, xylene, cumene, ethylbenzene, naphthalene, phenanthrene, anthracene, methane, ethane, propane, hexane, ethylene, propylene, acetylene, formaldehyde, acetaldehyde, acetone, methanol, ethanol or a mixture of two or more thereof.

26. (Previously presented) A method as claimed in Claim 1, wherein one or more boron and/or nitrogen containing compound is provided in addition to the carbon containing gas.

27. (Previously presented) A method as claimed in Claim 1, wherein one or more promoter compounds is provided in addition to the carbon containing gas.

28. (Original) A method as claimed in Claim 27, wherein the promoter compound is thiophene.

29. (Previously presented) A method as claimed in Claim 1, wherein a diluent gas is provided mixed with the carbon containing gas.

30. (Previously presented) A method as claimed in Claim 1, wherein the substrate particles are reacted within a fluidised bed.

31. (Previously presented) A method as claimed in Claim 1, wherein substrate particles are provided and product particles are removed from a reaction vessel in a continuous fashion.

32. (Previously presented) A method as claimed in Claim 1, further comprising the step of recovering the aligned nanostructures.

33. (Previously presented) A method as claimed in Claim 1, wherein gaseous effluent from the reaction is recycled with or without clean up.

34. (Previously presented) A method as claimed in Claim 1, wherein the reaction takes place at a temperature between 650 °C and 1250 °C.

35. (Canceled)

36. (Currently amended) Carbon nanostructures produced by [[a]] the method as claimed in any one of Claim 1 the preceding claims.

37. (Previously presented) Carbon nanostructures as claimed in Claim 36, wherein the nanostructures are separated from the substrate particles by partial or complete dissolution of the substrate particles or catalyst materials.